432 MHz MHz AND ABOVE EME NEWS

FEBRUARY 1998 VOL 26 # 2

ALLEN KATZ, K2UYH
Editor

ENGR DEPT., THE COLLEGE OF NEW JERSEY, TRENTON, NJ 08650-4700 (W 609-490-2817
OR H 443- 3184, FAX 609-443-1713, AND EMAIL:
Allen Katz, K2UYH

PRODUCTION ASSIST: **TOM KIRK, KA2VAD** (908-521-2049).

SKEDS CORD & DIRECTORY: **DL4EBY/DK0TU, KLAUS TIEDEMANN,**
HALSKESTR.35, D-12167 BERLIN, (49-30-7955467), E-Mail:

Klaus Tiedemann.

E-MAIL LIST CORD: Scott KD4LT

*** NA EME BBS: 704-284-4854 ***

EME NETS

14.345, 10 AM ET SATURDAYS, AFTER VARO NET SUNDAYS:

- NET CONTL: JOE, K1RQG (207-469-3492), E-MAIL: Joe, K1RQG
- EME STANDINGS: JIM STARKEY, W0KJY, 3845 CAPITOL DRIVE, FT. COLLINS, CO 80526, (970) 226-0669)
- THE NL WEB VERSION IS PRODUCED BY W6/PA0ZN AND AVAILABLE AT:

432 MHZ AND ABOVE NEWSLETTERS.

432 MHz AND ABOVE CHAT line

432 AND ABOVE PHOTOGALLERIES

CONDITIONS

Jan reports are somewhat mixed. Many found 70 cm conditions very good, but others were bothered by the high libration which most reported. Activity also received a mixed review. The situation was similar on 1296 with even a lower turn out at times. 23 and 13 cm activity were most probably affected by the Lunar Prospector satellite, which drew the attention of many EME operators - see JA4BLC and WB5LUA's reports. Another factor effecting activity this winter has been the weather. The upper north eastern part of the US and Canada were hit by what in some areas was the worst ice storm in modern history. Ice accumulated on wires to more than 10" in dia. Commercial towers collapsed under the weight of ice. K1WHS lost his 2 m EME array and most of his other antennas. Although there was lots of damage, fortunately it appears that none of the 432 up gang were put out of business by this storm. Hopefully Feb WX will be better, and Feb 1296 activity will receive a boost by this NL's 1st sponsored contest in 25 years - see below.

SSB EME CONTEST

The 1st NL 23 cm EME SSB Contest is scheduled for the 7/8 Feb SW. To encourage maximum participation the contest time period has been moved to correspond to the 2nd SW Moon operating day. The contest starts at local moonrise on Saturday 7 Feb, (This is the 2nd moonrise of the SW, the 1st is on Friday afternoon local time), and ends on the following moonset on Sunday 8 Feb. Scoring will be contact points times number of Grid Sectors (IO, JM, FN, ...). SSB to SSB contacts will count as 2 points. SSB to CW (or CW to SSB) 1 point. The exchange is your Grid Sector. Operation may be by single or multiple operators. No distinction for scoring will be made. I know of at least 3 stations who plan to compete. Hopefully there will be more. If this works out a similar contest can be tried on 70 cm.

CT1DMK

Luis writes -- After the ARRL contest I aligned my 10 GHz equipment and planned to install it for the coming SW. Unfortunately the WX conditions prevented any change, it kept raining, nonstop, for about a month ... and I simply gave up on 10 GHz until the spring. I have been mostly active on 23 cm. I did some sky noise measurements on 23 cm. The moon is about 0.1 dB to cold sky. 3C144 (Taurus A) also measured about 0.1 dB. 3C157 was clearly detected near Taurus A with about 0.03 dB. Several other sources were identified, but due to my dish window limitations some of the strongest sources could not be measured. Back in the contest I worked on 70 cm a few new stations, but I was a bit disappointed with the results. I was active only on the 1st weekend, and found too much QRM. I worked K1FO, DL9KR, OZ4MM, N2IQU for an initial #, DL9NDD, OE5JFL, OH2PO, UR5LX, F1ANH #, G3SEK, N9AB #, EA8FF #, K4QI #, K2UYH, SM3AKW, I2COR and N4GJV. On 23 cm I QSO'd F5PAU, LA8LF, S59DCD (very good sig), F6CGJ, HB9SV, EA3UM, K2DH, OE9ERC, VE1ALQ, OE5JFL, F6KSX, EA6ADW, W4OP #, OK1KIR, K5JL, W2UHI, G3LTF, OE9XXI, F2TU, ZS6AXT, F5AQC #, OH2AXH, GW3XYW, K2UYH, OZ4MM, K4QI, HB9BBD, OK1DFC #,

SM4DHN, N6BQ, F5PL, W4RDI #, DL0SHF on SSB and 4X6UJ # (a hard one). And after the end OE9ERC. In Dec and Jan I didn't add any new ones. I worked on 1296 W2UHI, LA8LF, DJ9YW, K5JL, W2UHI, K4QI on SSB, OK1KIR, S59DCD, KB2AH on SSB, VE1ALQ, OZ4MM and WA8WZG (O/O) - one of the hardest QSOs of the season. I missed W0KJY who was on at the same time and freq. I was puzzled until I figered out that there were 2 stations present, and by then my Moon window was finished. I later QSO'd LA8LF, W2UHI, S59DCD, KB2AH on SSB, K5JL and OE9ERC. 9H1ES was heard well, (M to O) copy during his QSO with LA8LF, and during my sked (M) copy. But this resulted in only a partial, since I was unable to receive any reports. 5.7 GHz is almost complete. My plans are to be on 5.7 and 10 GHz a lot during the spring. I am conducting some tests on 24 GHz, but as you might expect, I have no real TX power ... but searching hard. Any clues? On 18 Jan the Lunar Prospector was heard 6 to 10 dB above noise (main carrier) on 2273.0 +/- Doppler. Subcarrier 0 to 4 dB above noise on 2274.02 +/- Doppler, (both SNRs at 2.3 kHz bandwidth). I started listening at 0130 and lost signal after a few minutes, than I realized it was an occultation (by the Moon). This lasted from about 0140 to 0230. The event is in accordance with the NASA status report #10, (reports can be found at . I used my 5.6 m dish, but under illuminated by my Helix feed, HB converter (modified DMK's S-mode converter) at feed with 0.9 dB MGF1303. I had to use a 192 MHz IF since no other xtal/multiplier combination could be found. (Murphy's corollary: The chance you have a xtal for the right freq is inversely proportional to the number of xtals you have... I have about 500!) The 2nd conversion was performed to 28.0 MHz (using an R&S lab signal generator + SBL1) and the final rig was a TS850. I can be reached by e-mail at: Luis, CT1DMK

DL6UW

Nobert (JO44vj) is active on 23 cm with a 6 m solid dish mounted on a very impressive and greatly modified Warsaw-Pact surplus dish mount. Both the az and el drives are hydraulic with incremental optical encoders providing a resolution of .01 deg in both axis. The dish is controlled with F1EHN's computer interface and software. Norbert says it took him nearly 3 years to complete the mount. On 1296 he uses a VE4MA RHC pol horn feed with 18 m of 5/8" hard line and 4 m of 1/2" flex line. His PA is a YL 1050 of DL9EBL design. For receive he uses a FHX035 BV LNA with .45 dB NF and hears approximately 6 dB of CS/G noise and 16 dB of Sun noise. His Moon window is blocked to 13 degs in the east and 6 degs in the west. Nobert spends a good deal of his time on 1296 on SSB. He can be reached by tel at (49)+04356-351, Fax (49)+04356-1625. His address is (N. Wrede, Habyer Strasse 22, D- 24361 Gross Wittensee, Germany).

DL5YET

Markus (JO41ev) will return to 432 EME after a change of QTH in Feb. He will be again using 2 x 28 el yagis, but with full elevation, and 600 w from a 7650 final. His new address is (M. Toppmouer, Nordhorner Str. 33, 33335 Guterscoh, Germany).

DL9EBF

Hans Peter reports -- I am located in Toenisvorst, JO31gh. In 1998 I plan to remain QRV on 70 cm EME with 8x21 el Tonna yagis, 700 w PA, 2 stage preamp, and TR851E. Stations worked thus far are N2IQU, OH2PO, DL9KR, K1FO and SM2CEW. My Moon window is limited to els above 10 deg. Skeds are welcome via BBS: DL9EBF@DK0MWX, or e-mail to:
Hans Peter, DL9EBF

DL8OBU

Juergen (JO42xi) sends his greetings -- I'm QRV on 70 cm EME again after being off for nearly a year, due to the loss of my tower and antennas last April. Unfortunately I now have only 4 x 22 el (4.5 m) BV yagis, rather than the 35 el (7.5 m) yagis I had before. But the array works quite well. I hear my own echoes nearly every time. My power on 432 seems to be always wrong in the lists. I am running 1.2 kw. I'm just installing e-mail at my home. At the moment, I'm using , but I think this will change in 2 weeks. My home BBS is DB0ABZ (via HB9F), tel +49-5132-94100 and Fax (QRL) +49-5121-492156. Could you tell K5AZU and W9QXP that I never received their QSLs for our 1996 QSOs.

F5HRV

Herve besides his efforts on the Paris Conference is also helping with a 5760 EME effort. He wants to know the polarization standard for 6 cm? Is it linear (H or V) or circular (L or R)? You can reach Herve at e-mail:
Herve, F5HRU

G3LTF

Peter reports -- Jan condx seemed quite good, but activity was low. The libration rates on 1296 were high and signals never seemed quite as strong as normal. I found the connectors on the feed cable ends to be water logged even though covered with screw caps. Recent intense winds had driven the rain round the threads. I have fitted a second cover to stop this problem. When I did eventually get going on 9 Jan, on 432, I worked UA6LGH and KD4LT, CWNR HB9SUL and heard K4QI and DL4XX. On 2320 MHz, also on 9 Jan, I worked HB9SV for initial #14. On 10 Jan I had 13 cm skeds with K2DH and WA8WZG, but nil was heard, I assume due to WX problems. W7GBI was a great big signal on his sked, but my drive control broke and I couldn't keep the dish on the Moon. On 1296, on 10 Jan, I worked LA8LF, LX1DB on SSB and ZS6AXT, and on to the 11th KB2AH on SSB, K9BCT for initial #132, KD4LT #133, S59DCD, K5JL, OE9ERC on SSB and G4CCH, ending at 0230! Heard were IK6EIW, PA3CSG, GW3XYW, DJ9YW, CT1DMK, WD5AGO and 9H1ES. Later on the 11th I worked OE9ERC and 9H1ES (M/M) who was a reasonable signal, but seemed unsure of the procedure to end the EME QSO... we exchanged MRs and then Rs. Finally I went back to 432 to work K3HXO on sked #327 and DL4MEA. The 13 cm system seems to be working OK now, so I'm looking out for new ones. I now have the xtal I need for 2324, so I hope to be receiving there soon. My standings are on 13 cm initial #14, DXCC 12,

states 2 and grids 13; on 23 cm initial #134, DXCC 31, states 20 and grids 108; on 70 cm initial #327, DXCC 55, states 47 and grids 206.

HB9SUL

Andrea writes -- After having spent 10/12 months out in the field (including 8 months in TA), I was able to be QRV over the Jan SW. On Friday night, somebody replied promptly to my CQ, but I could not pick up the call... So I added in an additional preamp to my DJ9BV w/stripline cavity. I realized that what I had felt during the 1st leg of the ARRL contest was most probably true, that I was a little deaf. The new preamp seemed to improve reception greatly, and I discovered a new "sound", the music of signals coming from the Moon. QSO'd on 09 Jan were K4QI (449/449), on 10 Jan DF3RU (439/539) for an initial #, G4ERG (O/O) #, K1FO (339/449), HA1YA (349/O), JA5OVU (539/459), N2IQU (559/549), NC1I (559/559), SM3AKW (439/449) #, OE5EYM (O/O) #, OZ4MM (549/539) - all on random. On sked I worked on 12 Jan DL8OBU (O/O) #42. I will not be available over the Feb SW due to a holiday trip, most probably to LU. Please note my new e-mail address:
HB9SUL, Andrea

HP3XUG/KG6UH

Louis sends his apologies for missing his skeds in Jan -- On Friday morning of the SW, about 1000, I had an emergency come up that caused me to travel to our coffee farm near the TI border some 3.5 hours away. As I didn't arrive there until after 1600 local and had to stay the night, I didn't return until quite late Saturday night. Consequently, I missed the entire SW due to this problem. My apologies to all those with whom you had set me up with. As my e-mail is in David, I had no chance to send you a quick message either.

I5TDJ

Piero's Jan EME activity report -- I have was QRV only a little due to several conflicting commitments. Conditions seemed rather good, even if the libration fading was quite annoying. On 10 Jan I worked N2IQU, who had an outstanding signal pushing my S-meter to S6. On 11 Jan I heard absolutely nothing from sked with K5WXN, and at moonset worked OE5EYM (O/O) for initial #106.

IK0BZY

Enrico is a new station on 70 cm EME, and is interested in skeds. At present he has only 1 x 10 wl yagi and 600 w, but is working on a 4 yagi system. He has worked only DL9KR so far. Skeds can be arranged via e-mail at:
Enrico or
IK0BZY ,
by tel ++39-6-87122339, Fax ++39-6-87121330 and via the 20 m net.

IK5QLO

Andrea (JN53gu) is now QRV on 70 cm EME. He is using 2 x 28 el M2 9 WL yagis, HB 8877 PA with about 900 w, MGF1302 .4 dB NF LNA with TS440S, and DSP audio filter (IW5BHY-2). During the Jan SW Andrea QSO'd 7 stations, 5 on random, for a total of 4 more initials.

JA4BLC

Yoshiro's Jan radio activity was concentrated on the Lunar Prospector -- I am happy to report success in receiving the Lunar Prospector on 2273 and 2274 MHz. I heard its signal from 2113 until 2325 on 21 Jan. During this period I lost the satellite from 2203-2252, probably due to an occultation. SNR of the 2273 MHz carrier was 10-15 dB in a 100 Hz BW according to the AF9Y DSP software, and an SNR on the 2274 MHz subcarrier of 3-5 dB. My equipment was a HB 20' dish, modified S band TV converter, 144 MHz converter and 28 MHz receiver, TS830S and TS690V (for reception of the subcarrier). As I used the TX port of the 13 cm EME system (RHCP) with the LNA in the shack, the 4 dB feedline loss should in the NF giving a receiver NF of approximately 5-6 dB. The signals were heard on 22 Jan between 2223 and 2320, before work. I want to thank WB5LUA, K3PGP and CT1DMK for their encouragement and advise.

K1FO

Steve definitely feels that 70 cm EME activity is on the rise again. On the pre-skeds weekend conditions were great, the Moon was at perigee and several stations were active. Conditions and activity were great on the SW. 70 cm activity was heard from Moon rise on Friday afternoon through 11 PM Sunday night (local). Stations worked in Jan were on 03 Jan WE2Y for initial #528 (449/559), KA0RYT, W7QX, DF3RU (569/569) and (43/54) on SSB and WD5AGO, on 04 Jan JA3SGR, KN6M and DF3RU, 09 Jan HA1YA, UA6LGH, K4QI and OZ4MM, on 10 Jan G4ERG, DL4XX, HB9SUL, IK5QLO, WE2Y, EA8FF, EA3DXU, I5CTE and UA6LGH, 11 Jan LX1DB and (45/55) on SSB and DL4MEA, and on 12 Jan NC1I, W7QX, KL7HFQ and DK3FB. Stations heard but not worked during the Jan SW were SM3AKW, DL9KR, UR5LX, W7CI, K5WXN, OE5EYM and N2IQU. Worked during the ARRL Jan VHF Contest were DL5FN (449/559) #529, KA0RYT (FN31/EN34), DF3RU (FN31/JN59), DL9KR (FN31/JO40), KD4LT (FN31/EN81), DF6NA (FN31/JN49) and JA5OVU (FN31/PM74). 70 cm EME totals for K1FO are #529 initial, 49 states and 75 DXCC.

K4QI

Russ was active on 432 in Jan and writes -- The week end can be summarized by low activity and less than optimum conditions. Libration was worse than I have heard for a while. I will be only on 432 for a while. During the Xmas holidays, I had surgery on my right shoulder, so it will probably be a few months before I can handle a heavy object over my head, which is what is required to change the feed in my dish. On 9 Jan I

QSO'd K1FO, HB9SUL, G4ERG, OZ4MM, DL4XX and DF3RU, on 10 Jan HA1YA, KA0RYT, K1OR, UR5LX, UA6LGH, NC1I, IK5QLO, WE2Y, WA7BBM, K3HZO and I5CTE, and on 11 Jan K7XDV, DF3RU, DL9NDD, W7CI and NC1I.

KD4LT

Scott brings us up to date on his EME activity with his new 6.75 m dish on 23 cm. Scott has worked to following stations for initials running 100 w in the shack: K5JL, ZS6AXT, WD5AGO, K2DH, VE1ALQ, EA6ADW, WB5LUA, OH2AXH, OE9ERC, DJ9YW, W4RDI, N2IQU, LA8LF, WA8WZG, OK1KIR, K4QI, OZ4MM, NU7Z, W4OP, HB9SV, PA3CSG, S59DCD and G3LTF. Scott hopes to be on with his new TH-327 PA in about a month. The components have arrived to build the necessary power supplies and protection circuits. Scott is using the same scheme designed by Darrell, VE1ALQ, built and running at K5JL. On 70 cm, Scott was concerned about his receive performance. On 11 Jan Scott measured 16.2 dB of Sun noise. Scott changed the preamp at the feed with a commercial preamp, he had won at the Microwave Update in Ohio and the Sun noise improved to 19.4 dB. Needless to say, Scott found his receive problem. On 11- 12 Jan conditions were the best in a long while with several SSB contacts. Scott has recently worked the following stations for initials on 70 cm: W5ZN #302, K7XD #303, OE3JPC #304 and WE2Y #305. EME totals for KD4LT are on 70 cm #305 initial, 46 DXCC and 36 WAS, and on 23 cm #28 initial, 16 DXCC and 11 WAS.

LU6DW

Marc writes -- LU8EDR, Dany, LU4DHD, Willy and myself were able to listen to many signals on 23 cm during Jan SW due to some work on the preamp and the correct polarization sense at the feed. The 3.6 m dish is performing better, and we are planning construction of a new feed with both polarization senses. As soon as this is finished, we will be ready to try some low power QSOs with the bigger stations. I can be reached via e-mail at:
Marc, LU6DW

LX1DB

Willi sends news -- Since the end of Aug I was not QRV on EME due to several problems. My wife was in the hospital for several weeks, but all is now again fine. After that I was very busy at QRL. I had to install and put into operation a new automatic landing system for CAT 3 that allowed operation down to a visibility of only 50 m. Then my station was damaged by lightning. In the mean time I rebuilt all my EME power amplifiers and installed them in new racks. On my 2 dishes I change the tracking and indication system, which was based on 10 turn potentiometers and A/D converters to Bin encoders. The 2 dishes are now tracked with the F1ENH software under WIN95. On each band 144, 432 and 1296, I have 2 cavity amplifiers in parallel with TH338 tubes, so I have only one type of tube running in my station. Output is continuously 1.5 kw on each band. On 2304 I use now 2 power FET transistor amplifiers in parallel mounted on the feedhorn. Each has 80 w, so the output is 150 w at the feed. On 3456

MHz I have 20 w at the feed. All these bands are operational on the 10 m dish with an tracking accuracy of 0.150 deg. For the 5.6 GHz and 10 GHz bands, I use a 3.7 m commercial dish by Patriot with a tracking accuracy of 0.10 deg. The power on 5.6 GHz is 50 w at feedhorn from 2 power FET amplifiers in parallel. On the Rx the Moon noise is 1.5 dB. On 10 GHz the power at the feedhorn is 35 w from 2 power FET amplifiers in parallel, and the Moon noise on RX is 2 dB. All the power amplifiers are mounted at the feedhorns. On all the bands from 1296 MHz up to 10 GHz, I use circular pol. I will be active again for the Feb SW. Concerning the EME contest dates discussion, EME Contests have to have a has higher objective than just competition and a fight for QSO top scores. The real objective of the contest is to encourage greater interest in EME on each band and to promote EME activity!

NC1I

Frank writes -- Conditions during the Jan SW seemed excellent. I also felt that activity was noticeably higher than in Dec. I was unable to be on during some of the peek times and was still able to work more stations than last month even though I spent less time on. JA activity was very good on 10 Jan with outstanding signals and terrific RSTs received. I was unable to reinstall my cavity preamp until just after the SW. Sun noise has improved to about 19.5 dB and all intermod have disappeared. Stations worked since my last report are as follows: On 12 Dec at 0017 S52CW (559/559) and 0030 K1FO (579/579), on 20 Dec at 0740 DL4KG (539/549) and 0809 DF3RU (53/55) on SSB, on 10 Jan at 0104 K4QI (579/579), 0111 DL4XX (549/439), 0124 HA1YA (569/569), 0146 G4ERG (559/569), 0156 KA0RYT (569/569), 0212 IK5QLO (549/O), 0228 WA7BBM (579/549), 0235 N2IQU (579/579), 0240 W7CI (579/579), 0247 WE2Y (559/559), 0632 JH1EFA (549/579), 0640 JA5OVU (579/579), 07005 JA3lAF (559/579), 0724 JH4JLV (549/559), 0744 JA3SGR (439/559), 0808 JA9BOH (569/579), 0816 JA5NNS (539/569), 2125 EA8FF (569/569), 2135 SM3AKW (559/559), 2144 HB9SUL (559/559) and 2155 EA3DXU (439/549), on 11 Jan at 0034 DF4RU (569/539), 0043 OE5EYM (569/579), 0050 UA6LGH (559/569), 0211 KD4LT (55/55) on SSB, 0217 WI7Z (53/55) on SSB, 0224 W5ZN (539/559), 0257 DL9NDD (579/569), 0304 K4QI (579/579) and 2222 LX1DB (569/569), and on 18 Jan (for the ARRL VHF Contest) at 0459 KA0RYT (FN32/EN34), 0541 KN6M (FN32/EM13), 0554 DF3RU (FN32/JN59), 06l5 DF6NA (FN32/FN49), 0628 KD4LT CFN32/EM81), 0641 EA8FF (FN32/IL18), 0648 DL9KR CFN32/J040) and (589/599) and 0703 DL5FN (FN32/J040) and (559/559). I would like to thank all of those who took the time to get on for this event and apologize to any I may have missed after falling asleep at the operating position around 0730. Regarding the discussion over this year's contest dates I strongly urge we avoid the Sept VHF Contest weekend. One of my Dxpeditions to Vermont (1986 I believe) was during the June VHF Contest and much to our surprise several stations found our signals down around .020 and called us for tropo QSOs. I remember this cost us at least one EME QSO and cost that station a new state and initial. From a selfish standpoint I head up our club's multiop effort at a remote hilltop during the Sept contest, and having to choose between the 2 activities, I would have to go with the trope contest. I understand that would be my choice and my loss but perhaps others will be faced with the same decisions. If we survive all the ice storms, we will be active next month. I am really looking forward to the Eur contest in March.

Speaking of the ice storms, we were fortunate to be 80 km south of the freezing line when the northeast US and Canada was devastated earlier this month. We were not so fortunate on 15 and 16 Jan when we received 1/2" of ice. The weather on the 17th was warmer than expected and after several hours of careful work we had all the ice removed from the array. As I'm writing this report (21 Jan) forecasts are for a snow and ice storm starting in about 48 hours. I guess it's going to be one of those winters. And I used to hate the snow! I'm looking forward to seeing everyone in Paris this summer.

NP4B

Bob reports -- The 23 cm dual tube power amp from the estate of VE3ASO is now undergoing tests at NP4B. Bob has built a new 1100 Vdc, 0.5 Amp choke input power supply for the amp, and is obtaining 120 w out with the old tubes. A tube swap is coming up in search of more power. ((RF drive power is 50 w, final cathode bias is +48 volts [This seems a little high.]).

NU7Z

Rick is QRV on 10 GHz EME -- Great progress has been made on 10 GHz. I am now seeing 11.8 db of Sun noise and approximately 1.4 dB of Moon noise. I have worked WB5LUA and WA7CJO, and am interested in other skeds.

OZ4MM

Stig was QRV on 432 during the Jan SW -- I didn't find condx and activity too great. Anyway I worked IK5QLO with his 2 yagis. He had a FB signal considering his marginal setup. Other stations worked were on 9 Jan at 2232 K1FO, 2243 G4ERG, 2251 K4QI, 2256 DL4XX for initial #155 and 2320 UA6LGH, on 10 Jan at 0055 DF3RU, 0100 IK5QLO #156, 2326 KN6M, 2348 G4ALH and 2355 OE5EYM, and on 11 Jan 0002 HB9SUL. I plan to be on 13 cm next month with better power, and am looking for skeds there!

PA3CSG

Geert reports -- I was QRV on 1296 for the Jan SW and made initials with KD4LT and IK6EIW. I also worked LA8LF and heard 9H1ES. I was looking for 9H1ES, PY5ZBU and 4X6UJ, but heard nil except for 9H1ES. I will be on 1296 and possible 432 looking for new stations during the Feb SW.

S52CW

Silvo's contest report -- We were QRV in both parts of ARRL EME Contest. It was our 1st real operation with the new dish we built this summer. With our old 3 m dish, it was very difficult to copy weak signals and RSTs. Now with a 6.15 m dish copy was much

easier. QSOs on SSB are a piece of cake, HI! Some problems still occur, for example keeping the dish on the Moon. But anyway, we are very satisfied with the result. Equipment has not changed except for the dish. We are using a circular pol IMU horn, 150 w and 2 x ATF 35076 0.5 dB NF preamp. In 1998 we are planning to be QRV also on 13 cm. Our 1296 contest log reads as follows: EA6ADW (449/449), HB9SV (559/559), KB2AH (559/549), G3LTF (449/559), SM3AKW (539/539), OK1DFC (449/449), ZS6AXT (449/559), K2DH (559/549), OH2AXH (569/559), WD5AGO (539/339), F6CGJ (449/449), F6KSX (339/429), K5JL (539/569), OE9XXI (579/559), W4OP (339/439), SM4DHN (559/539), OE5JFL (579/559), F2TU (459/549), HB9BBD (569/539), DJ9YW (549/539), F5PAU (559/559), F1ANH (539/649), DD1XF (339/439), JH5LUZ (449/539), JA4BLC (539/549), ON5RR (449/539), OZ4MM (579/569), OE9ERC (559/559), DC6UW (559/549), W4RDI (539/549), WB5LUA (539/549), K2UYH (589/559), VE1ALQ (449/539), W2UHI (539/539), CT1DMK (539/539), LA8LF (559/559), W7GBI (539/549), EA3UM (539/449), OK1KIR (539/449), PA3CSG (569/549), I6QGA (449/449), 4X6UJ (449/559), JH3EAO (529/529), DF3RU (449/519), JL1ZCG (549/449), F5AQC (569/559), DD0SB (439/539), GW3XYW (539/549), G3LQR (339/439), F5PL (449/429), K4QI (559/549), N2IQU (569/549), DL0SHF (57/44) on SSB and OH2AXH (55/53) on SSB. On 13/14 Dec we QSO'd F5PL (559/339), DJ9YW (569/559), F1ANH (579/559), LA8LF (569/559), K4QI (55/43) on SSB, W2UHI (579/549), CT1DMK (449/449), KB2AH (55/54) on SSB, VE6TA (449/449) and VE1ALQ (559/559). Our address is (S. Obrul, Tomsiceva 43, 2380 Slovenj Gadec, SLOVENIA; Tel/Fax **386-602-43430, and e-mail: Silvio, S52CW

SV1BTR

Jimmy (KM17vx) is QRV again on 432 EME -- after 2 years of being QRT on 2 m EME, I have put up 4 x 32 el cross yagis (BV 11 WL) for 432 EME. I can switch between hor and vert pol. I have to finish some things with respect to the elevation readout, but I will be fully operational from 25 Jan onwards. TXout is 1.3 kw, RX is MGF1302 with 0.9 dB NF and DSP-9 Timewave with TS790E. I prefer night time skeds, after 2230, due to TVI problems. Elevation at moonrise should be >20 deg and at moonset >10 deg due to QRM. I am located on my moonrise only 1.5 Km from the antenna site of all FM radio stations and VHF-UHF TV stations in Athens. My tel is 0030-1-7480100, mobile 0030-94-784050 and e-mail is:
Jimmy, SV1BTR

W1ZX

Willie was on for the 11 Jan SW, but Murphy was also around. He had water in a connector which caused hi VSWR, and missed skeds with ON5OF, W5ZN and WB4BKC. He was very disappointed and wants to try again in Feb. Willie needs only 3 more states for WAS: ARK, KY, NEB.

W7BBM

John (formally WA7BBM) wants to make everyone aware of his recent change of call.

John is primarily active on 70 cm with a 40' dish, but can be coaxed on to 23 cm. He notes that his elevation is limited to angles > 45 degs. He will be away most of the coming summer and thus unavailable for skeds after May.

WA9FWD

John missed the 1997 ARRL EME Competition. He was out of town the 1st weekend. When he fired up for the Nov SW he found that his receive system was not working properly. The preamp box had water in it. He tried to operate with a preamp in the shack, but could only hear N2IQU. John plans to be QRV again in April after the weather warms up enough to make repairs on the array. He is still looking for any 70 cm EME activity from Utah, which would be his 50th state.

WB5LUA

Al is among those experimenting with the Lunar Prospector and submits the following report -- I 1st heard the carrier from the Prospector at about 0500 on 8 Jan. I had devised a way to receive 2273 MHz in addition to the normal 2304 MHz which I use for EME. 5 m dish antenna was parked at an elevation near 88 deg and azimuth around 170 deg. I had prepared myself to listen for the Prospector as it orbited around the Moon, but was surprised to hear a weak carrier as I tuned around 2 kHz below 2273 MHz. My frequency calibration was not too accurate. I had just tuned up the converter at lunch time and really did not have frequency and or antenna pointing too well known. I was very surprised to hear the carrier and after peaking on it found it to be between 5 and 10 dB over the noise in a 2.4 kHz bandwidth. I use a 2160 MHz local oscillator which translates the 2273 MHz down to an IF of 113 MHz which is monitored with a Yaesu FRG-9600 receiver. My feed and dish are set for receiving left hand circular pol and transmitting right hand circular pol. I am not familiar with the type of transmit antenna or the power level as used on the Prospector. My receiver NF is approximately 0.4 dB (28 deg K). The LNA uses an HP ATF-36077 HEMT. All equipment is home brew. The approximate antenna position from my location of EM13QC (lat 33 deg, 6 min, 53 sec north and lon 96 deg, 36 min, 54 sec west) was as follows: 8 Jan at 0500 el 82 deg and az 180 deg, 0510 el 81 deg and az 192 deg, 0536 el 77 deg and az 223 deg, 0552 el 75 deg and az 235 deg, and 0630 el 68 deg and az 258 deg. These positions are approximate. I did note that at about 0630, the Prospector and the Moon were within about 5 deg of the same azimuth for me. The prospector was about 35 deg higher in el than the Moon. I am really not familiar with orbital mechanics enough to know if they should appear to be that close together as viewed from the Earth after only a day away from earth. I assume that the Prospector was maybe a 4th of the way or about 60,000 miles away from Earth. Although all I heard was a carrier and no modulation or telemetry, I am reasonably sure that it was the Prospector. If not, then there is something else ALSO out there! The carrier was certainly not audible with my terrestrial antenna and it was moving across the sky and in the general direction of the Moon. On Saturday night local time, 11 Jan I was following the Moon Prospector on 2273 MHz as it was getting closer to intercepting the Moon's orbit. Unfortunately, it was not supposed to begin it's lunar orbit until around 6 am Dallas time when the Moon was

only a few deg above my western horizon. I was tired so I went to bed. The following afternoon at 0020 GMT on 12 Jan, I was hearing the Prospector as it was orbiting the Moon. Moon el was 14.1 deg and 77.4 deg az from my location. I was, however, surprised as to the signal strength. It was no stronger than it was prior to orbiting the Moon. It was my understanding that the Prospector would deploy an omni-directional antenna while on its way to the moon and then deploy a higher gain directional antenna while in orbit. I also had made provisions to receive the Prospector with right hand circular pol (RHCP) as opposed to the normal left hand circular pol (LHCP) used for receiving 2304 EME. I devised a 0.5 dB NF receiver for 2273 MHz which I connected to the (RHCP) transmit port of my feed. The 0.5 dB NF receiver was in the shack at the end of a 1 dB loss piece of 7/8 heliax. Signals were definitely being received better using RHCP as compared to LHCP. I measured the main carrier level at 2273 MHz to be 10 to 15 dB over the noise in a 500 Hz bandwidth. The subcarriers at + and - 1.02 MHz were significantly weaker than the main carrier and were measured at about 5 to 6 dB over the noise in a 500 Hz bandwidth. The main carrier appeared to have no discernable modulation on it. Both subcarriers have a series of dashes followed by a couple of dots and then periodic rough sounding tones which are most likely digitized information regarding flight conditions, etc. I followed the Prospector on 12 Jan from 0020 to 0125 when it went behind the Moon on one of its orbits. The Doppler was slowly going up in freq by a few kHz when all of a sudden, the signal went up in frequency a few hundred Hz where it stayed for a few seconds and then went off as it disappeared to the "dark side" of the Moon. Paul Wilson, W4HHK, who received some of the first Apollo transmissions on 2287.5 MHz back in 1971 told me about the "hook effect" which is the sudden shift in frequency as the Prospector disappears to the dark side of the moon. Not being sure as to how long the Prospector would be behind the moon and having other household things to do, I did not start to listen to it again until 0250. I expected or was hoping it would duck behind the Moon in an hour or so, so I could make a recording of the "hook effect". At 0709 on Monday, the Prospector was still transmitting so I decided it was time to go to bed. My son, N5QGH, and I finally figured that the lunar orbits can vary in position around the Moon, and that there could be an orbit where we see the entire orbit, i.e. it appears to an observer on Earth that the Prospector just circles the moon in a clockwise or counterclockwise fashion. The other interesting phenomena was the Prospector's signal level appeared to peak just below the Moon and slightly to the left as viewed from my location on Earth. The 1 dB beamwidth of my 5 m dish is 1 deg, so it is relatively easy to see the signal level peak at a position slightly different than where the noise from the Moon peaks. I would like to thank John Yurek, K3PGP, for making information regarding the Moon Prospector available on his web page, . John has also received the Prospector with a 12' dish. I also heard the Moon Prospector on 13 Jan at 0242 where the main carrier on about 2273.003 MHz was measured at 15 dB over the noise in a 500 Hz bandwidth.

ZS6AXT

Ivo feels my editing of his comments on the EME Contest Rules may have distorted his position. Here are his is his latest report with minimal editing -- In all my comments I NEVER asked for either 0 or Southerly dec. I recognize the fact, that great majority of

stations are North of Equator. Keep the dec in the North, for best compromise with other problems. My proposal was to limit the handicap of us "down under" by some means, eg. by dividing the points by the length of the theoretical Moon windows. This was not mentioned. Any theoretical discussions as done by Steve and others do not really reflect the real situation. I have operated from here for quite a while, so I know what is the situation is in the South! In each Contest I lose at least 3 multipliers, stations whom I hear and call with CWNR! I have 10 deg or less of el with stations whom I need for extra multipliers! Just listening how they work Eu and W stations, which are much stronger than me. IS THIS FAIR, STEVE?? The above is also a result of my low power; we are allowed here only 150 w INPUT on CW for the PA!! (Class 1 unlimited licence). So my 2nd proposal was to divide stations into two categories, QRO and QRP, with all stations in each category just marked "QRO" and "QRP". So that I can at least see in the end, that I am not really in the middle of the field, but better off! The points awarded for higher bands are not corresponding to the efforts of the stations operating on these bands. There should be more points for contacts on 23 cm and up for the multiband category, otherwise it is just a 2 m/70 cm Contest (for multiband stations). The above were reasons that I did not enter the 23 cm category this year, and will do so with regret again, if the rules are not adjusted. BTW - I think that it is time to widen EME operations outside the SWs. There is some activity already, but it should get more publicity. After all EME equipment is quite a capital outlay, and if operated only in SWs, it is greatly underutilised, HI! [Sorry if I misinterpreted your views last time. Ivo plans to attend the Paris conference and will be able to present his views 1st hand. I certain hope there will be a session reserved for discussion of EME Contest rules.] Ivo also writes -- There was quite a good activity during the Jan SW. I worked on 23cm DF3RU, GW3XYW, LA8LF, IK6EIW, DJ9YW, G3LTF, S59DCD, KD4LT, SM3AKW, OE9ERC, W3XS, K9BCT for initial #130, W2UHI, K5JL, WD5AGO, G3LQR, OE9ERC and SM3AKW. Heard were PA3CSG, HB9SV, F2TU, OK1KIR and HB9BBD. CWNR many times 9H1ES, who was (O) copy. During the next weekend (ARRL VHF Contest) I spent a few hours calling CQ, with no response, but later QSO'd WD5AGO and K5JL. Signals were good on both weekends and the weather here was ideal. I have PCBs for a 6 cm transverter and am working on becoming QRV on this band as well.

ZS6BTE

ZS6BTE: Ian is setting up for 10 GHz EME and is receiving signals, but appears disappointed by his results -- I monitored both weekends of the EME contest on 10 GHz using an all home brew receive. Moon noise peaked at 2.2 dB. WA7CJO was 18 dB above noise with DSP in a SSB bandwidth of 2.1 kHz and some noise reduction. His signal produced a high-quality d.c. note right down to the minimum CW bandwidth allowed by the DSP filter, 30 Hz. I also copied CT1DMK, DJ7FJ and 3 others. 10 GHz EMEers need to be weaned off linear polarization to avoid the spatial polarization shifts. This should enable more contacts. Otherwise activity was pathetic in what should have been an EME showpiece. There were also restricted windows for my QTH. Central USA was still working Moscow, which is to the east of my QTH, when the moon was below my horizon. If the idea of a contest is to encourage interest in a particular mode or propagation mechanism, then the existing ARRL EME format is a dodo, as

most contesters moved to the low frequency, crowded bands. From a level playing-field point of view, the ground is obviously not level for players in the southern hemisphere. I'm throwing the switch on 10 GHz EME for a while, as the expected results do not warrant the time or expense, and there is nothing to be gained from pee-ing in one's dark pants.... [I am sorry to hear your observations. When I 1st started experimenting on EME more than 30 years ago, there was less activity on 2 m and 70 cm than there is on 3 cm today. If everyone took your attitude there would be no EME today on any band. 10 GHz EME is still relatively new. It has grown tremendously is a relatively short time and has a great future.]

K2UYH

I do not have a lot to report this month. I had to go to Baltimore on the SW for a Microwave Conference Technical Planning meeting. This prevented any operation except on Friday night local time. I decided to stay on 1296 as I had no 432 skeds, but this was probably a mistake. 23 cm activity seemed very low. I was unable to get on before 0000 on 10 Jan and by that time most Eur station had apparently gone to bed. I did QSO at 0000 KB2AH (56/56) on SSB, 0003 W2UHI (55/54) on SSB, 0007 K5JL (56/55) on SSB, 0037 OK1KIR (559/559) and G4CCH (449/449). I called CQ for several more hours but hear no activity. The only station heard, but not worked was W4OP.

NETNEWS

IK2RTI who is QRV on 6 cm notes that his call was incorrectly listed in the Dec NL as IK2RIT. Also his name was incorrectly spelled. It is Gianfranco. [I did get the band right.]

F5SDD has a correction to his e-mail address. It should read:
Dave, F5SDD
Dave plans to be QRV on both 432 and 1296 for the DUBUS EME Contests.

W4BKC is QRV again on 70 cm with 8 yagis 1 kw and 8938 PA.

WE2Y, John is QRV on 70 cm with 6 deg el on moonrise and 10 deg on moonset.

HA1YA score 40x? in the ARRL EME contest.

LA8LF worked PY5ZBU on 23 cm in Jan in extra sked.

UT5DL has a new e-mail address .

KL7HFQ is now available for skeds via internet at .

DL9KR worked LY2WR during the Jan SW for country #81. LY2WR was using a single 30 el yagi and 600 w. He also QSO'd K1FO and NC1I during the Jan VHF Contest. Jan standings are now #687 initial, 81 DXCC and 50 states.

G4ALH's e-mail address is
G4ALH

DJ5JJ/EA6ADW has a new e-mail address: DJ5JJ/EA6ADW
and a brand new homepage: DJ5JJ's Home Page
Peter should be QRV from EA6 again in March.

VE1ALQ survived the big ice storm and is fully QRV again.

W5ZN worked on 5.7 GHz in Jan OE9ERC, OE9PMJ and OE9YTV. He heard SM4DHN.

DL5FN is fully QRV on 432 with 8 yagis and 1 kw from JO40, and is looking for skeds.

G4RGK is QRT due to storm damage. He will rebuild the H-frame, the yagis are ok, and hopes to be back on in 2 months.

RW4AQ is QRV again on 70 cm and has a new preamp.

FOR SALE

DD1XF has for Sale a 23 cm W2IMU feed with Hybrid. For hybrid details see DUBUS 4/94 page 36. You can reach Frank by e- Mail at:
Frank, DD1XF

DL4MEA is trying to buy a smart level. He found a German representative but their price was outrageous. He would like the telephone number of a stateside company which sells them. Guenter can be reached at:
Guenter, DL4MEA

W1ZX has for sale Real Times Devices AD 210 Board and instruction to interface with the W9IP Tracking Program $US190 + shipping, HP415A SWR Meter $US30 + shipping, HP415D SWR Meter $US35 + shipping, HP415E SWR Meter $US45 + shipping, Dielectric-Coaxial Dynamics 1000A Wattmeter $US115 + shipping, several Bird 43 Wattmeters: (1) $170, (2) $185, (3) $200 with new meter movement, (4) Bird 43 wattmeter, fair condition (broken meter face glass) $US125 + shipping, AIL 75 Noise Figure Meter (good condition) $US275Sh & Shipping, HP349US 25, Noise Comm Noise Diodes NC305 $33. Call Willie at 301 645 5584, 1830-2300 EST, FAX 301 645 6853, 24 hrs or e-mail to:
Willie, W1ZX

WA5TKU is looking for an F1EHN board. You can contact Wes at e-mail:
Wes, WA5TKU

PA3CSG has for sale a RF deck for 144 MHz amplifier, using a new GS35 tube, very good EME power out with the tube's specs. Geert also has several Low Pass Filters, following the stepped impedance design discussed in this NL. Contact Geert at e-mail:

Geert, PA3CSG

KB2AH has a full line of cavity amps and 1, 2, 4 and 6 tube ring amps, lin/circular feed horns and LNAs for 432 and 1296. Tom also has mounting blocks for K1FO yagis. For full details see Tom's 1296 WEB page , for more details and pricing info e-mail Tom, KB2AH
or phone 908-223-5067, FAX 908-223-0901 (24 hrs) or voice 908-223-8124.

FINAL

The issue of the date for the 98 ARRL EME Contest still has not been settled. Rumor has it that K1FO's solution of going to Oct and Dec is the front runner. I am disappointed that my suggestion of running the ARRL's Sept VHF Contest and the 1st weekend of the EME Contest on the same weekend was not taken seriously. This would have created some very interesting contest strategy options and allowed moonbounce for the 1st time to have a major impact on VHF contest scores. [For the view from the other see NC1I's report.]

¨This month another problem with the ARRL has surfaced. It was my understanding that W0KJY Standing List would be used in the ARRL's EME Standings List, and that it was unnecessary to submit EME standing separately to the ARRL just as long as you were up to date with Jim. This apparently is not the case, and thus many high standing EMEers are missing from the ARRL's list. This coupled with the problem of missing scores from last year's ARRL EME Contest results has certainly tarnished the ARRL's image in many EMEers eyes. W5ZN who is on the ARRL's board of directors is trying to do his best to correct these problems.

¨Contest wise there is the NL's 23 cm SSB Contest this month, and then next month the DUBUS/REF EME Contest starts with 144/1296 activity.

¨If you have not visited the NL's WEB page recently. I highly recommend it. Rein has done a fabulous job with the graphics and new feedback options. If you have the capabilities you can get the NL with the pictures printed in full color. This is something that I can not offer in the mailed version.

¨I want to apologize to those of you who could not reach me by e-mail around 18-21 Jan. There was a problem with e-mail address related to the name change of the College of New Jersey. It has been corrected and there should be no difficulties in reaching me in the future at my e-mail address. I hope this problem did not cause anyone to miss getting their reports into the NL. Please keep the information coming. Technical reports are especially needed. Don't forget to get your material in for the Paris Conference. The Paris group appears to be doing an outstanding job organizing this summer's conference. I hope to see many of you off the Moon during the coming SW, especially during the 1296 SSB Contest.

73, Al-K2UYH

Skeds for FEB 6

Time	432.040				
2230z	F1ANH -SV1BTR				
2300z	DK3WG -SV1BTR				
2330z	K1FO -SV1BTR				

Skeds for FEB 7

Time	432.040	432.045	432.055	432.060	432.070
0000z	G3SEK -SV1BTR	W5ZN -HA1YA	K7XD -DK3WG		
0030z	KD4LT -SV1BTR	DL5FN -W5ZN	KA0RYT-HA1YA		
0100z	K0RZ -SV1BTR	DL5FN -W0KJY			
0130z	SV1BTR-HA1YA				
0230z	W7BBM -DK3WG	ON5OF -W1ZX			
0300z		W5ZN -W1ZX			
0500z	W7BBM -WB0GGM				
0530z	W7GBI -K3HZO				
0630z	K7XD -JA9BOH	JJ1NNJ-K3HZO			
0700z	K7XD -K3HZO	7M2PDT-WB0GGM			
0730z	K7XD -7M2PDT	JA2KRW-WB0GGM			
0800z	JA9BOH-WB0GGM				
1530z	G4ERG-JA5NNS				
1600z	DL4XX-7M2PDT				
1630z	DL4XX -G4ERG	DK3WG-JH7PAV			
1700z	ON4KNG-ZS6AXT	G4ERG-JS3SIM			
1730z	CT1DMK-ON4KNG	G4ERG-JA3IAF			
1800z	G4ERG -DF9QX				
2100z		WB2VVV-DK3WG			
2130z		K3HZO -DK3WG			
2200z	K4QI -SV1BTR	NA4N -DK3WG	K3HZO -DL4KG	HP3XUG-ON4KNG	
2230z	SV1BTR-UR5LX	WB0GGM-DJ6MB		K3HZO -G4ERG	
2300z	ZS6AXT-SV1BTR	W6VPH -DK3WG	K3HZO -DL4MEA	WB0GGM-OK1KIR	
2330z	DL9NDD-SV1BTR	K7XD -UR5LX	WB0GGM-EA3UM		

Skeds for FEB 8

Time	432.040	432.060
0000z	K3HZO -G4FUF	WB0GGM-G3LTF
0100z	K7XD -SV1BTR	
0130z	SV1BTR-KA0RYT	
0200z	W7FN -SV1BTR	
2300z	LU4HO -DK3WG	

Skeds for FEB 6

Time	1296.050

```
1500z  DJ9YW -JH3EAO

  Skeds for FEB  7

Time    1296.050        1296.075       2304.050

0000z                                  SM3AKW-G3LTF
0030z                                  K2DH  -G3LTF
0100z                                  WA8WZG-G3LTF
0130z                                  W7GBI -G3LTF
1530z  DJ9YW -JH3EAO
1630z  DJ9YW -9H1ES
2130z  DJ9YW -9H1ES
2200z                 4X6UJ -PA3CSG
2230z                 PY5ZBU-PA3CSG
2300z  W3XS  -DJ9YW   9H1ES -PA3CSG
2330z                 9H1ES -K2UYH

  Skeds for FEB  8

Time    1296.050        1296.075       5760.100       10368.100

0000z  W0KJY -DJ9YW                    IK2RTI-OK1KIR
0030z  KB0PYO-G3LTF                    W5ZN  -OK1KIR  NU7Z  -SM4DHN
0100z  PY5ZBU-G3LTF                                    NU7Z  -OK1KIR
0200z  PY5ZBU-KD4LT   W7BBM -K2DH
0230z                 W7BBM -KD4LT
0300z                 W7BBM -W2UHI
1630z  PA0JCA-G3LTF
1700z  9H1ES -OK1KIR
2130z  W3XS  -OK1KIR
2200z  K9BCT -OK1KIR
2230z  PY5ZBU-OK1KIR
2300z  W3XS  -DJ9YW
2330z  NP4B  -OK1KIR

 Skeds for FEB  9

Time   1296.050

0030z  W0KJY -DJ9YW
```

Step Impedance Low Pass Filters by PA3CSG

It always has been a problem to get our harmonics down to a level which was according to our regulations. Filters using ordinary capacitors are not able to handle the power. The step impedance low pass filters that have been available on the European flea markets solved this problem. I used them for a year or so in my 144 and 432 MHz stations. These filters were equipped with "N" type connectors as input and output. It was rather doubtful to use these connectors at EME power levels. But no problem came

up for a couple of years. Until my 144 MHz amplifier was used at ON5LL, the nearby Belgium contest group. For an unknown reason one of the "N" type connectors flashed. I never had opened the filter before but at that time I just had to replace the "N" type connector. The inside looked simple and easy to rebuild using thicker tubing allowing a 7/16 connector on the ends.

Well first tests produced indeed a very sharp low pass filter. Second harmonic was -43dB down, the rest was below -50dB. This looked just fine until the filter was tested on the network analyzer. This test showed a rather high insertion loss and a low return loss. Or better, the low insertion loss was on the wrong frequency. I decided to build a return loss bridge in order to be able to measure the return loss with the spectrum analyzer and the sweeper. Many hours of playing with filter followed. It was possible to tune the filter to the desired frequency by rotating the inner conductor and/or changing the thickness of the dielectric. Things proved to be critical. A rotation of only a few millimeters gave totally different results. I investigated the possibility of gluing the inner conductor to the PTFE of the 7/16 connector. This provided only mediocre results. One thing was clear, the filter was too critical to put in use.

I decided to make the passband wider, allowing less ripple and trading it against a less steeper slope on the 2nd harmonic. I used the Eagleware software to accomplish this and later I also used the Touchstone program. With help of the software it was possible to create a filter for 432 MHz less critical but still acceptable results. It was interesting to see the differences in simulation between the 2 programs. Both programs fitted very well with the reality. It was necessary to tune the filter by rotating the inner conductor and thus using the eccentric of the mechanics in order to tune to the filter. Tuning was done using the sweeper and the spectrum analyzer. Later I tuned the filter to least amount of capacitance using an ordinary capacitor tester. This was fairly OK.

The 432 MHz version

Construct the filter using the dimensions from drawing. Make sure the whole inner conductor is as straight as possible. Rolling it on a flat surface can check this.
The outer tube is aluminum 25 x 22mm diameter. The flanges for the connector are made of aluminum 50mm diameter with hole of 25 mm to "press-fit" on the tubing. After pressing the flanges on the tubing, some Loctite 420 can be used to secure the flanges.
Another possibility is to weld the flanges. Cut the outer tube in such a way that it is about 1mm shorter than the inner conductor is. This makes a "press fit" with the 7/16 chassis connectors. Slide a piece of PTFE sheet of 0.3mm thickness into the outer conductor. Make sure that there is not too much overlapping on the sheet. To center the inner conductor in the aluminum tube a small strip of 2-3 mm wide PTFE sheet is wrapped around the center. How the 7/16 connector is connected to the inner tube depends on how your chassis connector looks like. Mine from the German manufacturer "Telegärtner" had tiny M3 screws in the center pin. These screws I replaced by longer ones.

Testing and aligning.

1. Using a capacitance meter.
This method gives only a rough check. Connect one of the 7/16 with the capacitance bridge and leave the other end open. Rotate the inner conductor and adjust for minimum capacitance. My meter had a reading of 55-57 pF. When you don't see much difference in the reading you done a good mechanical job. Meaning that the inner conductor is very well in the middle.
2. Using a spectrum analyzer, sweeper and a VSWR bridge.
This is a far better way of tuning the filter. Connect one end of the filter with a good 50 Ohm dummy load. Rotate the inner conductor for best match. Always turn the inner conductor clockwise, otherwise your center pin of the 7/16 connector might loosen. After the alignment, and just for the fun, push on the outer tube with your thumb…. You'll see how critical the return loss is… Make sure that you use good adapters and dummy loads for testing.
3. Using a network analyzer.
Well if you have one of these available, there is no need of telling you how to do this.

The results of the 432 MHz low pass filter can be seen in graph 1.

The 144 MHz long version.

After completing the 432 MHz version the 2 meter version looked simple. Dimensions can be scaled in frequency and found in table 1. Actually it worked on first try, but as the 2 meter version is longer it is more difficult to place the inner conductor in the center. Use 4, 6-8 mm wide PTFE strips, to center keep the inner in place. 2 Strips wrapped around the middle, on the outer ends. The 2 others on each end of the thick end pieces. Alignment is the same as for the 432 MHz filter.

A network analyzer plot is shown in Graph 2.

Anyway, this should give you the chance to comply with your local regulations. If these filters don't do the job, maybe you can better have look at your amplifier.

Special thanks to Hubert, ON6JZ for his help and advice and to Jack PE1KXH for his numerous network analyzer plots.

Leave Contest Info or Comments to Allen Here

The LATEST on the The Paris EME Conference

This information was obtained from: Scott, KD4LT

Top Page

For Comments or corrections: Rein, W6/PA0ZN